What is claimed is:

1. A method of determining the efficiency of a dialyzer of a dialysis machine during a dialysis treatment wherein the dialyzer is divided by a semipermeable membrane into a blood chamber and a dialysis fluid chamber and wherein blood flows at a predetermined flow rate through the blood chamber and dialysis fluid flows at a predetermined flow rate through the dialysis fluid chamber, said method comprising:

during the dialysis treatment, determining at least one of a blood flow rate Qb through the blood chamber, a dialysis fluid flow rate Qd through the dialysis fluid chamber, and an ultrafiltration rate Qf; and

on the basis of at least one of a clearance K1 and a dialysance, each being established at at least one of a predetermined blood flow rate Qb1, a predetermined dialysis fluid flow rate Qd1, and a predetermined ultrafiltration rate Qf1, determining at least one of a clearance and a dialysance D(Qd(t), Qe(t), Qf(t)) at at least one of a blood flow rate Qb(t), a dialysis fluid flow rate Qd(t), and an ultrafiltration rate Qf(t) thus determined.

2. The method of claim 1, further comprising:

calculating a diffusive component D1 of at least one of the clearance and the dialysance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1 from the clearance K1 or the dialysance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1 according to the following equation:

$$D1 = \frac{K1 - Qf1}{1 - Qf1/Qe1},$$

wherein an effective blood flow Qe is calculated as follows from the blood flow rate Qb corresponding to a delivery rate of a blood pump according to the following equation:

$$Qe = Qb\left(1 - \frac{HCT}{100}\right)Fp,$$

wherein HCT is the hematocrit (%) and Fp is the plasma water fraction.

3. The method of claim 2, further comprising:

calculating a diffusive dialysance D(Qd(t), Qe(t)) for any dialysis fluid flow rate Qd(t), blood flow rate Qe(t) and ultrafiltration rate Qf(t), from the clearance K1 or the dialysance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1 according to the following equations:

$$D(Qd(t), Qe(t)) = Qe(t) \cdot \left(1 - \exp\left(\frac{Qd(t)}{Qd1} \ln\left(1 - \frac{DQecorr}{Qd(t)}\right)\right)\right)$$

wherein

$$DQecorr = Qd1\left(1 - \exp\left(\frac{Qe(t)}{Qe1} \ln\left(1 - \frac{D1}{Qd1}\right)\right)\right).$$

4. The method of claim 3, further comprising:

calculating the sum of the diffusive and convective

dialysance K(Qd(t), Qe(t), Qf(t)) or the clearance from the diffusive dialysance D(Qd(t), Qe(t)) according to the following equation:

$$K\left(Qd(t),Qe(t),Qf(t)\right) = D\left(Qd(t),Qe(t)\right)\left(1-\frac{Qf(t)}{Qe(t)}\right) + Qf(t)$$

5. The method of claim 4, further comprising:

determining the sum of the diffusive and convective dialysance K(Qd(t), Qe(t), Qf(t)) or the clearance for different times t during the dialysis treatment; and

determining an effective clearance K_{eff} by calculating the average of the sums of the diffusive and convective dialysance K(Qd(t), Qe(t), Qf(t)) or the clearances for different times t during the dialysis treatment.

6. The method of claim 1, wherein the blood is sent into the blood chamber through an arterial branch of an extracorporeal circulation and is removed through a venous branch, with a blood pump being connected to the arterial branch or the venous branch and the dialysis fluid flowing into the dialysis fluid chamber through a dialysis fluid inlet line and flowing out through a dialysis fluid outlet line, with a dialysis fluid pump being connected to the dialysis fluid inlet line or the dialysis fluid outlet line, further comprising:

determining the dialysis fluid flow rate Qd or the blood flow rate Qb by determining the delivery rates of at least one of the blood pump and the dialysis fluid pump.

7. A dialysis machine, comprising:

a dialyzer;

a semipermeable membrane dividing the dialyzer into a blood chamber and a dialysis fluid chamber, the blood chamber having an inlet and an outlet, and the dialysis fluid chamber having an inlet and an outlet;

an arterial blood line connected to the inlet of the blood chamber;

a venous blood line connected to the outlet of the blood chamber;

a dialysis fluid inlet line connected to the inlet of the dialysis fluid chamber;

a dialysis fluid outlet line connected to the outlet of the dialysis fluid chamber;

rate determining means for determining at least one of a blood flow rate Qb through the blood chamber, a dialysis fluid flow rate Qd through the dialysis fluid chamber, and an ultrafiltration rate Qf;

means for determining at least one of a clearance and a dialysance during a dialysis treatment, at at least one of the blood flow rate Qb, the dialysis fluid flow rate Qd, and the ultrafiltration rate Qf determined by the first device.

8. The dialysis machine of claim 7, wherein the means for determining at least one of a clearance and a dialysance is a computer unit which determines at least one of the clearance and the dialysance at at least one of a measured blood flow rate Qb(t), a measured dialysis fluid flow rate Qd(t), and a measured ultrafiltration rate Qf(t), on the basis of at least one of a clearance K1 and the dialysance established at at least one of a predetermined blood flow rate Qb1, a predetermined dialysis fluid flow rate Qd1, and a predetermined ultrafiltration rate Qf1.

9. The dialysis machine of claim 8, wherein the computer unit calculates a diffusive component D1 of the dialysance or the clearance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1, from the clearance K1 or the dialysance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1 according to the following equation:

$$D1 = \frac{K1 - Qf1}{1 - Qf1/Qe1},$$

wherein an effective blood flow Qe is calculated from the blood flow rate Qb corresponding to a delivery rate of a blood pump according to the following equation:

$$Qe = Qb\left(1 - \frac{HCT}{100}\right)Fp,$$

wherein HCT is the hematocrit (%) and Fp is the plasma water fraction.

10. The dialysis machine of claim 9, wherein the computer unit calculates a diffusive dialysance D(Qd(t), Qe(t)) for any dialysis fluid flow rate Qd(t), blood flow rate Qe(t) and ultrafiltration rate Qf(t), from the clearance K1 or the dialysance at the predetermined dialysis fluid flow rate Qd1, the predetermined blood flow rate Qb1, and the predetermined ultrafiltration rate Qf1 according to the following equations:

$$D\left(Qd(t),Qe(t)\right) = Qe(t)\cdot\left(1 - \exp\left(\frac{Qd(t)}{Qd1}\ln\left(1 - \frac{DQecorr}{Qd(t)}\right)\right)\right)$$

wherein

$$DQecorr = Qd1\left(1 - \exp\left(\frac{Qe(t)}{Qe1}\ln\left(1 - \frac{D1}{Qd1}\right)\right)\right).$$

11. The dialysis machine of claim 10, wherein the computer unit calculates the sum of the diffusive and convective dialysance K(Qd(t), Qe(t), Qf(t)) or the clearance from the diffusive dialysance D(Qd(t), Qe(t)) according to the following equation:

$$K\left(Qd(t),Qe(t),Qf(t)\right) = D\left(Qd(t),Qe(t)\right)\left(1 - \frac{Qf(t)}{Qe(t)}\right) + Qf(t)$$

12. The dialysis machine of claim 7, wherein the rate determining means is designed so that at least one of the clearance and the dialysance can be determined for different times t during a dialysis treatment and an effective clearance K_{eff} can be determined by averaging the dialysances or the clearances for different times t during the dialysis treatment.

13. The dialysis machine of claim 7, further comprising:

a blood pump connected to the arterial blood line or the venous blood line;

a dialysis fluid pump connected to the dialysis fluid inlet line or the dialysis fluid outlet line; and

wherein the rate determining means determines a delivery rate of the blood pump or the dialysis fluid pump.